

REMARKS

Claims 1-95 are pending in the present application. The Examiner has rejected claims 1-95.

I. ATTORNEY DOCKET NUMBER

Applicants respectfully request that the attorney docket number for the above-identified application be changed from "39388/CAG/B600" to --15265US01--.

II. INFORMATION DISCLOSURE STATEMENT

Applicants gratefully acknowledge that the Form PTO-1449 was considered by the Examiner on April 12, 2004. However, Applicants respectfully draw the attention of the Examiner to the section entitled "FOREIGN PATENT DOCUMENTS" in which the four (4) patent documents were not considered by the Examiner as indicated by a lack of the Examiner's initials by the four (4) patent documents. If this was merely an oversight, then Applicants respectfully request that the Examiner consider these four (4) patent documents, initial another copy of the Form PTO-1449 and return the initialed Form PTO-1449 in a subsequent official communication. If this was not merely an oversight, then Applicants respectfully request that the Examiner clarify as to the reason for not considering the four (4) patent documents.

III. REJECTION OF CLAIMS 1-18, 20-38, 40-59 AND 61-94 UNDER 35 U.S.C. § 103(a)

Claims 1-18, 20-38, 40-59 and 61-94 stand rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 6,194,962 B1 ("Chen") in view of U.S. Patent No. 5,382,916 ("King"). Applicants respectfully traverse the rejection.

M.P.E.P. § 2145 states that "[i]t is improper to combine references where the references teach away from their combination".

Applicants respectfully submit that Chen and King teach away from each other. For example, Chen describes two sets of complementary differential pairs: a first differential pair MP1, MP2 comprising p-channel FETs and a complementary second differential pair MN1, MN2 comprising n-channel FETs. See, e.g., Chen at col. 3, lines 39-46. Furthermore, in featuring an adaptive trimming system as essential to the invention, Chen teaches that "[t]he

invention is used with op amps which include complementary differential pairs in their input stages. . . . The adaptive trimming system is advantageously employed as long as an op amp includes complementary differential pairs in its input stage, each of which is active over a different portion of the common-mode input range." See, e.g., Chen at col. 4, lines 55, 56 and 59-63.

On the other hand, King teaches away from the requirements of Chen. For example, the Examiner cited col. 7, lines 1-58 of King which relate, in part, to FIGS. 7a-f. FIGS. 7a-f of King show an amplifier 602 of a sample-and-hold block 304, which is illustrated in FIG. 6 of King. Instead of two sets of complementary differential pairs (e.g., a first pair of n-channel FETS and a second pair of p-channel FETS) as required by Chen, King teaches an amplifier 602 with "inputs 701-702 [that] connect to a modified Darlington differential pair 703, 704". Thus, King teaches away from the two sets of complementary differential pairs by instead employing a single, modified Darlington differential pair. In fact, the very core of the Chen invention (i.e., the adaptive trimming system) is no longer advantageous since "[t]he adaptive trimming system is advantageously employed as long as an op amp includes complementary differential pairs in its input stage" (Chen at col. 4, lines 59-63). For at least the above reasons, Applicants respectfully submit that Chen and King are improperly combined.

In addition, in solving the trimming problem in rail-to-rail op amps, Chen teaches that "[r]ail-to-rail op amps . . . typically employ complementary differential pairs, instead of the single differential pair found in conventional amplifiers." See, e.g., Chen at col. 1, lines 21-26. Thus, Chen definitely teaches away from the "conventional amplifiers" that have merely a single differential pair such as, for example, the single Darlington differential pair 703, 704 as taught by King. For at least the above reasons, Applicants respectfully submit that Chen and King are improperly combined.

Furthermore, Chen teaches an invention relating "to the field of operational amplifier offset voltage (V_{os}) trimming techniques, and particularly to V_{os} trimming for op amps with rail-to-rail input stages". See, e.g., Chen at col. 1, lines 6-8. On the other hand, King does not employ rail-to-rail input stages nor rail-to-rail op amps. See, e.g., King at col. 7 lines 28-30 (part of text cited by the Examiner relating to amplifier 602 of sample-and-hold block 304) ("the inputs (which are V_{in} and V_{out}) are to be in the range of -2.5 to $+2.5$ volts and the rails are at $+5$ volts and -5 volts"). Thus, the input ranges of amplifier 602 fail to sweep from rail to rail.

Accordingly, King teaches away from rail-to-rail input stages or rail-to-rail op amps and makes no mention of operation amplifier offset voltage (V_{os}) trimming techniques in the text cited by the Examiner. For at least the above reasons, Applicants respectfully submit that Chen and King are improperly combined.

The Examiner respectfully drew the attention of Applicants to FIG. 10 of King which shows a comparator cell 902 of a 7-bit flash analog-to-digital converter 306 (which is different and separate from the amplifier 602 and the sample-and-hold block 304 described above) of a converter 300. The comparator cell 902 includes a first gain stage 1010, a second gain stage 1020, a latch 1030 and an output NOR gate 1050. The first gain stage 1010 includes NPN emitter followers 1001, 1002 and an NPN differential pair 1003, 1004. The second gain stage 1020 includes an NPN differential pair 1021, 1022. The latch 1030 includes cross-coupled NPNs 1033, 1034. See, e.g., FIG. 10; col. 9, line 51 to col. 10, line 2 of King (part of text cited by the Examiner).

With respect to these NPN transistors, King states: "Note that the switching and latching involves only current switching in NPN devices, so the voltage swings stay down in the range of 0.5 volt and do not create as much noise as comparable CMOS logic switching." On the other hand, Chen does not employ NPN devices, but instead employs CMOS technology. See, e.g., Chen at FIG. 3; col. 3, lines 38-46. Thus, Chen teaches away from the noise reduction (noise performance) of King. Noise performance, according to the Examiner, was one of the main reasons for combining Chen and King. Accordingly, Applicants respectfully submit that, where King explicitly teaches away from Chen in this regard, the combination of King and Chen cannot be deemed proper.

For at least the above reasons, Applicants respectfully submit that a rejection based on the combination of King and Chen cannot be maintained. It is respectfully requested that the rejection under 35 U.S.C. § 103(a) be withdrawn with respect to claims 1-18, 20-38, 40-59 and 61-94.

IV. REJECTION OF CLAIMS 19, 39, 60 and 95 UNDER 35 U.S.C. § 103(a)

Claims 19, 39, 60 and 95 stand rejected under 35 U.S.C. § 103(a) as being obvious over Chen in view of U.S. Patent No. 6,175,279 B1 ("Ciccarelli"). Applicants respectfully traverse the rejection.

Neither Chen nor Ciccarelli, alone or in combination, teaches or suggests each and every element as set forth in claims 19, 39 and 60. For example, claims 19, 39 and 60 recite that either the common differential output or the differential output "comprises first and second outputs, and the matching circuit comprises an inductor having a first end coupled to the first output and a capacitor having a first end coupled to the second output, the inductor and capacitor each having second end coupled together". The Examiner admits that Chen does not teach or suggest at least these elements of claims 19, 39 and 60. See Office Action at section 3, page 18. On the other hand, the Examiner maintains that Ciccarelli teaches or suggests these elements and offers FIG. 5A as well as supporting text in Ciccarelli as evidence in support of the rejection. Nevertheless, at least these elements are not taught or suggested by Ciccarelli. For example, Ciccarelli does not even teach or suggest a differential output or a common differential output in FIG. 5A and thus does not teach or suggest a first output and a second output. Instead, FIG. 5A shows a single-ended low-noise amplifier, thus teaching away from a differential output or a common differential output. FIG. 5A merely shows only one output, RF OUTPUT, to which only capacitor 1536 is coupled. Since Ciccarelli does not teach or suggest another output, Ciccarelli does not teach or suggest an inductor coupled to another output. For at least the above reasons, the Examiner has failed to demonstrate how the combination of Chen and Ciccarelli teaches or suggests each and every element as set forth in claims 19, 39 and 60.

Furthermore, neither Chen nor Ciccarelli, alone or in combination, teaches or suggests each and every element as set forth in claim 95. For example, claim 95 recites that "the amplifying stages comprises a differential output having first and second outputs, and the matching circuit comprises an inductor having a first end coupled to the first output and a capacitor having a first end coupled to the second output, the inductor and capacitor each having second end coupled to the amplifier output". The Examiner admits that Chen does not teach or suggest at least these elements of claim 95. See Office Action at section 3, page 19 ("Claim 95 contains similar limitations addressed in claim 19, 39, 60, and therefore is rejected under a similar rationale"). On the other hand, the Examiner maintains that Ciccarelli teaches or

suggests these elements and offers FIG. 5A as well as supporting text in Ciccarelli as evidence in support of the rejection. Nevertheless, at least these elements are not taught or suggested by Ciccarelli. For example, Ciccarelli does not even teach or suggest a differential output in FIG. 5A and thus does not teach or suggest a first output and a second output. Instead, FIG. 5A shows a single-ended low-noise amplifier, thus teaching away from a differential output. FIG. 5A shows only one output, RF OUTPUT, to which only capacitor 1536 is coupled. Since Ciccarelli does not teach or suggest another output, Ciccarelli does not teach or suggest an inductor coupled to another output. For at least the above reasons, the Examiner has failed to demonstrate how the combination of Chen and Ciccarelli teaches or suggests each and every element as set forth in claim 95.

It is therefore respectfully requested that the rejection under 35 U.S.C. § 103(a) be withdrawn with respect to claims 19, 39, 60 and 95.

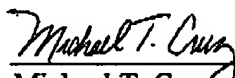
V. CONCLUSION

In view of at least the foregoing, it is respectfully submitted that the pending claims 1-95 are in condition for allowance. Should anything remain in order to place the present application in condition for allowance, the Examiner is kindly invited to contact the undersigned at the below-listed telephone number.

Please charge any required fees not paid herewith or credit any overpayment to the Deposit Account of McAndrews, Held & Malloy, Ltd., Account No. 13-0017.

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Respectfully submitted,


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